

Part 3 -- Remarks

This Amendment and Response responds to the office action mailed March 2, 2004. A Petition for a Two Month Extension of Time and the fee therefor accompanies this Amendment and Response, thereby extending the time for response to August 2, 2004.

In the March 2 office action, claims 6-15 were rejected under 35 U.S.C. 112 as indefinite; claims 1, 3-6, 8-10 and 14 were rejected under 35 U.S.C. 102(b) as anticipated by Susuki et al. (3,666,590); claims 2 and 7 were rejected under 35 U.S.C. 103(a) as obvious from Susuki in view of Casella (5,399,221) and/or Fell (5,252,163); claim 11 was rejected under 35 U.S.C. 103(a) as obvious from Susuki in view Chapman (5,508,083); claim 12 was rejected under 35 U.S.C. 103(a) as obvious from Susuki in view of Mayer (2,547,880) and/or Chapman; claim 13 was rejected under 35 U.S.C. 103(a) as obvious from Susuki in view of Casella and/or Fell and further in view of Bequet (3,744,952); and claim 15 was rejected under 35 U.S.C. 103(a) as obvious from Susuki in view of Scogland (2,454,719).

Reconsideration of these objections and rejections is respectfully requested, with respect to the pending new claims 16-41.

The amendments to the specification, set forth in Part 1, are to correct grammatical errors, to improve the form of the specification, and to introduce a basis in the specification for the "peaks" and "valleys" which are inherent in corrugated material. No new matter has been added.

Original claims 1-15 have been canceled, and the subject matter of those claims has been incorporated in new claims 16-41.

No new matter has been introduced in new claims 16-41. The antecedent basis for certain new claim terms is as follows: abutting contact portions, page 6, lines 16-18 and 27; heating substantially only at the abutting contact portions, page 6, lines 14-18; performing the heating and pressing while the sheets are in motion, page 6, lines 19-22; simultaneous feeding the sheets, page 4, line 23-page 5, line 10 and page 6, lines

14-18; heating only by the core bars, page 5, line 3 and page 6, lines 16-18; pressing between the core bars and press rolls, page 5, line 27-page 6, line 4; guide members for bringing the sheets into contact with one another, page 2, line 18-19 and page 4, lines 23-24; heating and pressing along a path page 5, line 27-page 6, line 4 and page 6, lines 14-19; contact surfaces for transmitting energy, page 6, line 27; and an energy source within and remote from the core bars, page 6, lines 23-30.

New claims 16-41 are believed sufficiently definite as now written. The indefiniteness rejection of original claims 6-12 is not believed to apply to the new claims 16-41.

Reconsideration of the anticipation and obviousness rejections of the original claims, as they might now apply to the new claims, is respectfully requested.

As set forth more specifically in new method claim 16, heating of the first and second sheets occur substantially only at the abutting contact portions where the peaks of the first sheet contact the second sheet, and the heating and pressing of the abutting contact portions occurs while the sheets are in motion from simultaneously feeding the sheets. New independent apparatus claim 28 also more specifically sets forth similar features, by reciting in the manner more specifically set forth, that each core bar transfers energy substantially only into the abutting contact portions while the sheets are simultaneously moved and a press device presses the sheets together at the abutting contact portions as the sheets are simultaneously moved.

Heating substantially only the abutting contact portions at the peaks of the wave-shaped sheet, as recited in the new claims, provides many significant advantages and improvements. The energy is transferred directly to the abutting contact portions where the adherence occurs, so external machinery which contacts the sheets other than at the abutting contact portions does not have to be heated, cooled or made resistant to adherence of the heated sheets. By directing the energy at the point where the adherence occurs at the abutting contact portions, the temperature of the sheets can be elevated more quickly because energy can be focused at the point where it is

needed. Energy is not wasted in heating portions of the sheets where adherence is not required or desired. The manufacturing process can progress more rapidly and less expensively, because it is not necessary to heat up the entire sheets. By not heating the other portions of the sheets, the portions of the sheets adjacent to the abutting contact portions serve as a heat sink for transferring the heat away from the abutting contact portions after adherence occurs. The heat sinking capability achieves a quicker set up of the adhered abutting contact portions, which stabilizes the manufactured corrugated material more quickly and allows it to be handled more quickly. These advantages can be understood from the specification at page 6, lines 14-22, and at page 2, lines 22-27, among other places.

These and other claimed features, as well as many of the other features recited in claims dependent on independent claims 16 and 28, are not believed to be disclosed or suggested by Suzuki, Casella, Fell, Chapman, Mayer, Bequet, and/or Scogland.

Suzuki, the primary reference applied in rejecting all of the original claims, describes a process in which both entire sheets are heated to a temperature which allows them to adhere together. The heat is applied to steel belts which contact the sheets. The heat is transferred from the steel belts to the sheets themselves. The steel belts must be "exteriorly lubricious" to prevent adhesion of the sheets. See Suzuki, column 3, lines and 44-67. Thus, Suzuki does not disclose or suggest heating the sheets substantially only at the abutting contact portions.

Casella describes a sheet-by-sheet manufacturing process where heat is transferred and pressing occurs while the sheets are stationary, not in motion as recited in the claims. Heating rods 24 are inserted into the stationary valleys of the wave-shaped sheets from opposite sides of the sheet, and a heating platen 25 is lowered onto the stationary sheets. The heating and pressing do not occur while the sheets are in motion. See column 6, lines 31-52.

Casella does not describe or suggest applying stationary heating and pressing to a process involving in-motion heating, pressing and adhering. Moreover, the

orientation of the peaks and valleys in Casella is perpendicular to the direction that at least the wave-shaped sheet is fed, as understood from Fig. 1, making in-motion heating and pressing unlikely or impossible.

Nothing in Suzuki or Casella suggests an effective combination of their concepts. Suzuki teaches that the entire sheets should be heated to obtain effective adherence. Casella teaches that localized heating is only possible in a stationary process where heat is transferred from stationary rods and a reciprocating heated platen. Combining the two references would appear to substitute the intermittent rod and platen heating of Casella for the heated belts of Suzuki, but such a substitution would necessarily still require stationary movement of the sheets while they were pressed and adhered together. Nothing in Suzuki describes or suggests the use of the backing members 31, 32 or 33 shown in Figs. 3 and 4, as heating members. Thus, there is no teaching, suggestion or motivation in Suzuki or Casella for combining the references. Even combining Suzuki in Casella fails to reach the scope of the pending claim limitations, because such a combination does not provide in-motion heating, pressing and adherence.

Fell is similar to Casella. Heating bars 1 and 4 shown in Fig. 1 are inserted and withdrawn intermittently in a direction perpendicular to the advancement of the sheet. It appears that either a reciprocating platen (Fig. 6) or a cog wheel moves over the inserted bars to press the heated sheets together. Again, nothing suggests that the heating, pressing and adherence occur while the sheets are in motion. Combining Fell with Suzuki is subject to the same deficiencies as the combination of Casella with Suzuki.

Chapman describes a pair of dies use to form wave-shaped sheets. Mayer describes a machine to form a sheet into a wave-shape. Bequet describes the use of electric heating elements for heating sheets of material. Scogland describes a device for forming sheets into corrugated material using three levels of bars for deforming three or four sheets into the corrugated shape. It is not apparent that anything in

Chapman, Mayer, Bequet, or Scogland relates to heating substantially only the abutting contact portions of two sheets while in motion, and pressing the heated abutting contact portions to adhere the two sheets while in motion. Accordingly, the combination of Chapman, Mayer, Bequet, or Scogland, with Suzuki and/or Casella or Fell, is not believed to remedy any of the deficiencies in the teachings and suggestions of Suzuki and/or Casella or Fell, as discussed above.

The new dependent claims are also believed to be patentable. Claims 21 and 29 relate to transferring energy for heating the abutting contact portions to the adherence temperature substantially only from the core bars. Suzuki does not describe heating his bars, and Casella and Fell use other elements in addition to bars for heating the abutting contact portions. Claims 18-20, 31, 35 and 36 relate to heating substantially only the abutting contact portions and pressing the abutting contact portions in a direction parallel to the longitudinal movement of the sheets, which is not believed to be described or suggested in any of the references. Claim 37 defines the energy source as remote from the core bars, a concept which is not described. The other dependent claims are believed to recite patentable subject matter in combination with the claims upon which they depend, or for other reasons not explained herein.

It is believed that all pending claims in this application are in condition for allowance. Allowance is respectfully requested. The Examiner is requested to contact the undersigned by telephone to discuss any issues which might inhibit the immediate allowance of the application.

Respectfully submitted,

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By: 

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